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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
Bureau of Agricultural and Industrial Chemistry
Naval Stores Research Division
2100 Robert E. Lee Boulevard
New Orleans 19, Louisiana

EQUIPMENT

for

GUM REFINING PROCESS

Photostatic copies of the drawings referred to in this publication are available upon specific request from naval stores processors contemplating installation of the equipment described.

Naval Stores Station

Olustee, Florida

February 1945

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U. S. DEPARTMENT OF AGRICULTURE

EQUIPMENT

for

GUM CLEANING PROCESS

INTRODUCTION

In response to numerous requests, the Naval Stores Research Division of the Bureau of Agricultural and Industrial Chemistry, has prepared a set of drawings showing typical equipment which is recommended for use in operating the gum refining process, commonly known as the "Station process". This process was developed at the Naval Stores Station, Olustee, Florida, and is covered by U. S. Patent No. 2,254,785 granted to W. C. Smith, J. O. Reed, F. P. Veitch and G. P. Shingler.

COMMENTS OF THE DRAWINGS

These drawings show typical pieces of equipment which have proved to be satisfactory in the commercial operation of this process. They do not purport to be complete detailed working drawings but are intended merely as a guide to assist in obtaining satisfactory equipment. The dimensions indicated are only approximate and the drawings as reproduced are not to be scaled. The sizes of the various pieces of equipment and their relative location can easily be changed to suit individual requirements. Owing to the wide variation in the desired capacity of gum refining plants as well as in local conditions such as the topography of the plant site, it is obvious that no blanket recommendations can be made which will fit everyone's requirements. It is believed, however, that with the aid of these drawings and after consultation with competent engineers and fabricators, a satisfactory installation can be obtained. Certain modifications in design have been indicated as "optional". It would, no doubt, be possible to use equipment which differs considerably from that indicated in these drawings and still obtain satisfactory results.

The Naval Stores Research Division of the Bureau of Agricultural and Industrial Chemistry is always eager to serve the naval stores industry, and the engineers and technologists at the Naval Stores Station, Olustee, Florida, are particularly interested in assisting naval stores producers to obtain proper equipment for the efficient and satisfactory operation of the "Station" gum cleaning process.

FABRICATORS AND ENGINEERS

The names of some fabricators and engineers are shown below, but it is to be understood that the list is probably incomplete and that the firms listed are not recommended over others in the same field.

Aluminum Company of America, Atlanta, Georgia
Blaw-Knox Company, Birmingham, Alabama
Chattanooga Boiler and Tank Company, Chattanooga, Tennessee
Chicago Bridge and Iron Company, Birmingham, Alabama
R. D. Cole Manufacturing Company, Newman, Georgia
Combustion Engineering Company, Inc., 1032 Main Street,
  Chattanooga, Tennessee
Jacksonville Copper Still Company, P. O. Box 862,
  Jacksonville, Florida
R. P. Newton, Jr., P. O. Box 506, Orangeburg, South Carolina
Struthers-Wells Company, Warren, Pennsylvania

OPERATION OF THE PROCESS

The operation of the gum cleaning process recommended by the Naval Stores Station may be outlined briefly as follows:

Charge melter (N.S. 201) preferably from a dump vat (N.S. 202).

Dilute with turpentine to bring the final turpentine content of the gum to at least 35-40 percent by weight. Ordinarily, this means adding about 4 to 5 barrels of turpentine to 15 barrels of gum.

Melt the gum in the melter with both jacket steam and jet steam through the spargers, bringing the temperature of the gum up to 200-230°F., depending on the age and class of gum and the presence of scrape.

(Optional) Add 2 to 4 pounds of "filter aid", such as, for example, Celite #503 or Dicalite #4200.

Filter through cotton flannel, paper, cotton batting, or other suitable filtering material. The necessary pressure (from 5 to 50 p.s.i.) is furnished by the pressure in the melter, using additional jet steam, if required.

Wash by jetting through perforated pipe in bottom of wash tank (N.S. 203) which contains water. About 800 gallons of water is sufficient for 3 to 4 melter charges.

Settle. Allow the washed gum to settle in the wash tank for at least 6 to 8 hours. The temperature of the gum at the beginning of the settling period should be 160-180°F.

Draw off wash water to the sewer through pipe line equipped with a sight-glass. Run the "muck" to a muck tank for ultimate recovery of turpentine and low grade rosin.

Distill the filtered washed gum in a steam still in the usual manner.

Chip handling is best accomplished by cleaning the chips caught on the melter screen with, say 100-200 gallons of turpentine and steam, after every 2 or 3 melter charges (depending on the cleanliness of the gum). The turpentine containing the "chip cleanings" is jetted into the wash tank. The chips are then steamed and dumped.

PATENT LICENSE

The patent covering this gum refining process (U.S. Pat. No. 2,254,785) has been assigned to the Secretary of Agriculture. A license to operate under this patent can be obtained without cost merely by applying to the U. S. Department of Agriculture, Washington, D. C. It is requested that all operators planning to use this process, obtain such a license.

ACKNOWLEDGMENT

For the preparation of this publication, acknowledgment is made to L. W. Mims, Chemical Engineer at the Naval Stores Station, Olustee, Florida, who prepared sketches of the various pieces of equipment and revised and checked the drawings. The drafting was done by S. W. Solera. Acknowledgment is also made to N. C. McConnell, Naval Stores Technologist, and G. P. Shingler, Chemist in Charge, at the Naval Stores Station, Olustee, Florida, and to L. E. Knapp, Head, Naval Stores Research Division, 2100 Robert E. Lee Boulevard, New Orleans, Louisiana.